WHAT IS CLAIMED IS:

1. A structural laminate member comprising:

a first metal layer having a first inner surface and a first outer surface;

a second metal layer having a second inner surface and a second outer surface, the second metal layer being spaced apart from the said first metal layer; and

an intermediate layer comprised of a plastic material having a modulus of elasticity greater than 200 MPa, the plastic material located between and adhered to said first and second inner surfaces such that local buckling of the individual layers of the structural laminate member is prevented.

2. A structural laminate member according to claim 1, wherein said plastic material is unfoamed.

3. A structural laminate member according to claim 1, wherein said plastic material is an elastomer.

4. A structural laminate member according to claim 3, wherein said elastomer is a polyurethane.

5. A structural laminate member according to claim 1, wherein each of said first and second metal layers have a thickness in the range from 0.2 to 30 mm.

6. A structural laminate member according to claim 1, wherein said plastic material has a tensile strength in the range of from 5 to 75 MPa.

7. A structural laminate member according to claim 1, wherein said plastic material has a minimum elongation of about 20% at -45°C.

8. A structural laminate member according to claim 1, wherein said plastic material has an elongation in a range from 20 to 800%.

9. A structural laminate member according to claim 1, wherein said plastic material has a minimum bond strength over the entire operating temperature range of 1.0 Mpa.

10. A structural laminate member according to claim 1, wherein said intermediate layer further comprises a void form.

11. A structural laminate member according to claim 10, wherein said void form is a rigid foam form.

12. A structural laminate member according to claim 11, wherein said rigid foam form is made of polyurethane.

13. A structural laminate member according to claim 12, wherein said rigid foam form has a density in the range of 10 kg/m^3 to 200 kg/m^3.

14. A structural laminate member according to claim 10, wherein said void form is made of a material that is compatible with the core material.

15. A structural laminate member according to claim 14, wherein said void form is made of sheet steel.

16. A structural laminate member according to claim 1, wherein said plastic material has a sufficient bond strength so that said metal layers achieve full plastic moment capacity and shear strength without requiring welding.

17. A structural laminate member comprising:

a first metal layer having a first inner surface, a first outer surface and a first thickness;

a second metal layer having a second inner surface, a second outer surface and a second thickness, the second metal layer being spaced apart from the first metal layer; and

an intermediate layer comprised of a plastic material having a modulus of elasticity greater than 200 MPa, the plastic material located between and adhered to said first and second inner surfaces, such that shear forces are transferred between said first and second metal layers so that the structural laminate member has a flexural strength greater than the flexural strength of a single metal layer with a thickness equal to the combined thicknesses of the first and second metal layers.

18. A structural laminate member according to claim 17, wherein said plastic material is unfoamed.

19. A structural laminate member according to claim 17, wherein said plastic material is an elastomer.

20. A structural laminate member according to claim 19, wherein said elastomer is a polyurethane.

21. A structural laminate member according to claim 17, wherein each of said first and second metal layers have a thickness in the range from 0.2 to 30 mm.

22. A structural laminate member according to claim 17, wherein said plastic material has a tensile strength in the range of from 5 to 75 MPa.

23. A structural laminate member according to claim 17, wherein said plastic material has a minimum elongation of about 20% at -45°C.

24. A structural laminate member according to claim 17, wherein said plastic material has an elongation in the range of from 20 to 800%.

25. A structural laminate member according to claim 17, wherein said plastic material has a minimum bond strength over the entire operating temperature range of 1.0 MPa.

26. A structural laminate member according to claim 17, wherein said intermediate layer further comprises a void form.

27. A structural laminate member according to claim 26, wherein said void form is a rigid foam form.

28. A structural laminate member according to claim 26, wherein said void form is made of a material that is compatible with the core material.

29. A structural laminate member according to claim 28, wherein said void form is made of sheet steel.

30. A structural laminate member according to claim 17, wherein said plastic material has a sufficient bond strength so that said metal layers achieve full plastic moment capacity and shear strength without requiring welding.

31. A structural laminate member according to claim 27, wherein said rigid foam form is made of polyurethane.

32. A structural laminate member according to claim 31, wherein said rigid foam form has a density in the range of 10 kg/m^3 to 200 kg/m^3.

33. A structural laminate member comprising:

a first metal layer having a first inner surface and a first outer surface;

a second metal layer having a second inner surface and a second outer surface, the second metal layer being spaced apart from the first metal layer; and

an intermediate layer comprised of a plastic material having a modulus of elasticity greater than 200 MPa, the plastic material located between and adhered to said first and second inner surfaces such that, under load, energy is absorbed by the structural laminate member by a combination of strain dissipation, increased puncture resistance and inelastic membrane action of the laminate member.

34. A structural laminate member according to claim 33, wherein said plastic material is unfoamed.

35. A structural laminate member according to claim 33, wherein said plastic material is an elastomer.

36. A structural laminate member according to claim 35, wherein said elastomer is a polyurethane.

37. A structural laminate member according to claim 33, wherein each of said first and second metal layers have a thickness in the range from 0.2 to 30 mm.

38. A structural laminate member according to claim 33, wherein said plastic material has a tensile strength in the range of from 5 to 75 MPa.

39. A structural laminate member according to claim 33, wherein said plastic material has a minimum elongation of about 20% at -45°C.

40. A structural laminate member according to claim 33, wherein said plastic material has an elongation in the range of from 20 to 800%.

41. A structural laminate member according to claim 33, wherein said plastic material has a minimum bond strength over the entire operating temperature range of 1.0 MPa.

42. A structural laminate member according to claim 33, wherein said intermediate layer further comprises a void form.

43. A structural laminate member according to claim 42, wherein said void form is a rigid foam form.

44. A structural laminate member according to claim 42, wherein said void form is made of a material that is compatible with the core material.

45. A structural laminate member according to claim 44, wherein said void form is made of sheet steel.

46. A structural laminate member according to claim 33, wherein said plastic material has a sufficient bond strength so that said metal layers achieve full plastic moment capacity and shear strength without requiring welding.

47. A structural laminate member according to claim 43, wherein said rigid foam form is made of polyurethane.

48. A structural laminate member according to claim 47, wherein said rigid foam form has a density in the range of 10kg/m^3 to 200 kg/m^3.

49. A structural laminate member comprising:

a first metal layer having a first inner surface and a first outer surface;

a second metal layer having a second inner surface and a second outer surface, the second metal layer being spaced apart from the first metal layer; and

an intermediate layer comprised of a plastic material having a modulus of elasticity greater than 200 MPa, the plastic material located between and adhered to said first and second inner surfaces such that a crack formed in one of the first and second metal layers is prevented from propagating to the other of said first and second metal layers.

50. A structural laminate member according to claim 49, wherein said plastic material is unfoamed.

51. A structural laminate member according to claim 49, wherein said plastic material is an elastomer.

52. A structural laminate member according to claim 51, wherein said elastomer is a polyurethane.

53. A structural laminate member according to claim 49, wherein each of said first and second metal layers have a thickness in the range from 0.2 to 30 mm.

54. A structural laminate member according to claim 49, wherein said plastic material has a tensile strength in the range from 5 to 75 MPa.

55. A structural laminate member according to claim 49, wherein said plastic material has a minimum elongation of about 20% at -45°C.

56. A structural laminate member according to claim 49, wherein said plastic material has an elongation in the range of from 20 to 800%.

57. A structural laminate member according to claim 49, wherein said plastic material has a minimum bond strength over the entire operating temperature range of 1.0 MPa.

58. A structural laminate member according to claim 49, wherein said intermediate layer further comprises a void form.

59. A structural laminate member according to claim 58, wherein said void form is a rigid foam form.

60. A structural laminate member according to claim 58, wherein said void form is made of a material that is compatible with the core material.

61. A structural laminate member according to claim 60, wherein said void form is made of sheet steel.

62. A structural laminate member according to claim 49, wherein said plastic material has a sufficient bond strength so that said metal layers achieve full plastic moment capacity and shear strength without requiring welding.

63. A structural laminate member according to claim 59, wherein said rigid foam form is made of polyurethane.

64. A structural laminate member according to claim 63, wherein said foam form has a density in the range of 10 kg/m^3 to 200 kg/m^3.

65. A method of making a structural laminate comprising the steps of:

positioning a first metal layer and a second metal layer in a spaced apart relationship such that a core cavity is formed between facing surfaces of the first and second metal layer, each of the first and second metal layers having a thickness in a range from 0.2mm to 30mm;

providing an uncured plastic material to said core cavity; and

curing the uncured plastic material such that the plastic material adheres to the facing surfaces of the first and second metal layers and such that the plastic material has a modulus of elasticity greater than 200 MPa.

66. The method of making the structural laminate of claim 65 wherein said positioning is accomplished by placing a spacer between the first metal layer and the second metal layer.

67. The method of making the structural laminate of claim 66 further comprising:

attaching the spacer to one of the first and second metal layers.

68. The method of making the structural laminate of claim 67 further comprising: attaching the spacer to the other of said first and second metal layers.

69. The method of making the structural laminate of claim 67 wherein the spacer is attached by welding.

70. The method of making the structural laminate of claim 67 wherein the spacer is attached by adhering.

71. The method of making the structural laminate of claim 67 wherein the spacer is metal.

72. The method of making the structural laminate of claim 67 wherein the spacer is plastic.

73. The method of making the structural laminate of claim 67, wherein the spacer is a metal plastic laminate.

74. The method of making the structural laminate member of claim 65 wherein the core cavity has an open end and the uncured plastic is provided to the core cavity through the open end.

75. The method of making the structural laminate member of claim 65 further comprising:

providing an aperture through the thickness of one of the first and second metal layers, and wherein the uncured plastic is provided to the core cavity through the aperture.

76. The method of making the structural laminate member of claim 75 further comprising:

sealing the aperture.

77. The method of making the structural laminate member of claim 76 wherein the aperture is sealed with a metal plug.

78. The method of making the structural laminate member of claim 77 wherein the aperture and the plug are cooperatively threaded.

79. The method of making the structural laminate member of claim 77 wherein the aperture and the plug are riveted together.

80. The method of making the structural laminate member of claim 77 wherein the aperture and the plug are press fit together.

81. The method of making the structural laminate member of claim 65, further comprising the step of, before said providing an uncured plastic material step, providing a void form to said core cavity.

82. The method of making the structural laminate member of claim 65, further comprising the step of, before said providing an uncured plastic material step, providing a rigid foam form to said core cavity.

83. The method of making the structural laminate member of claim 65, further comprising the step of, before providing an uncured plastic material step, providing a void form made of a material that is compatible with the core material.

84. The method of making the structural laminate member of claim 77, wherein the metal plug is one of: (1) adhered with a material; (2) filled with material and (3) made of a material having a melting point greater than the melting temperature of the core material.

85. The method of making the structural laminate member of claim 84, wherein the melting temperature of the core material is greater than 200°C.

86. A method of making a structural laminate member

comprising:

positioning a surface of a first metal plate opposite and spaced apart from a surface of a second metal plate to form a core cavity, each of the first and second metal plates having a thickness in a range from 0.2mm to 30mm, one of the first and second metal plates having a portion adapted to be welded, the portion adapted to be welded defining a weld margin in a part of the core cavity adjacent to the portion adapted to be welded;

providing an uncured plastic material to the core cavity such that the weld margin is devoid of plastic; and

curing the uncured plastic material such that the plastic material adheres to the first and second metal layers and such that the plastic material has a modulus of elasticity greater than 200 Mpa.

87. The method of making a structural laminate member of claim 86, wherein the portion adapted to be welded is a peripheral edge.

88. The method of making the structural laminate member of claim 86, further comprising the step of, before said providing an uncured plastic material step, providing a void form to said core cavity.

89. The method of making the structural laminate member of claim 86, further comprising the step of, before said providing an uncured plastic material step, providing a rigid foam form to said core cavity.

90. The method of making the structural laminate member of claim 86, further comprising the step of, before providing an uncured plastic material step, providing a void form made of a material that is compatible with the core material.

91. A method of making a double walled structure comprising:

forming a first wall by positioning a first metal layer spaced apart from a second metal layer such that a core cavity is formed between facing surfaces of the first and second metal layers;

forming a second wall by positioning a third metal layer spaced apart from a fourth metal layer such that a core cavity is formed between facing surfaces of the third and fourth metal layers;

supporting the first wall in a position adjacent to and spaced apart from the second wall such that an access cavity is defined between the second metal layer of the first wall and the third metal layer of the second wall;

providing an uncured first plastic material to the core cavity of the first wall through an aperture in at least one of the first and the second metal layer of the first wall, the aperture permitting communication between the access cavity of the double walled structure and the core cavity of the first wall;

providing an uncured second plastic material to the core cavity of the second wall through an aperture in at least one of the third and the fourth metal layer of the second wall, the aperture permitting communication between the access cavity of the double walled structure and the core cavity of the second wall;

curing the uncured first plastic material such that the first plastic material adheres to the facing surfaces of the first and second metal layers of the first wall and such that the plastic material has a modulus of elasticity greater than 200 MPa; and

curing the uncured second plastic material such that the second plastic material adheres to the facing surfaces of the third and fourth metal layers of the second .

92. The method of making the double wall structure of claim 91 wherein the first plastic material and the second plastic material are the same material.

93. The method of making the double wall structure of claim 91 further comprising: sealing the apertures in the second metal layers.

94. The method of making the double wall structure of claim 93 wherein the apertures in the metal layers are sealed with a metal plug.

95. The method of making the double wall structure of claim 94 wherein the apertures in the metal layers and the plug are cooperatively threaded.

96. The method of making the structural laminate member of claim 94 wherein the aperture and the plug are riveted together.

97. The method of making the structural laminate member of claim 94 wherein the aperture and the plug are press fit together.

98. The method of making the double wall structure of claim 94, wherein the aperture and plug are adhered together.

99. The method of making the double wall structure of claim 94, wherein liquid metal is cast to plug the aperture.

100. A method of making a structural laminate comprising the step of:

adhering a plastic material slab having a modulus of elasticity greater than 200 MPa between facing surfaces of a first metal layer and a second metal layer, each of the first and second metal layers having a thickness in a range from 0.2mm to 30mm.

101. A structural laminate member according to claim 1, wherein said plastic material has air entrainment between 3% and 7%.

102. A structural laminate member according to claim 17, wherein said plastic material has air entrainment between 3% and 7%.

103. A structural laminate member according to claim 33, wherein said plastic material has air entrainment between 3% and 7%.

104. A structural laminate member according to claim 49, wherein said plastic material has air entrainment between 3% and 7%.